

**U.S. ARMY CORPS OF ENGINEERS**  
**RELEVANCE TO THE ARMY AND THE NATION**  
**PEACETIME AND WARTIME**

**Karen L. Durham-Aguilera**  
**Michael G. Enschede**  
**Gary A. Loew**  
**Dale S. Mazar**  
**Samuel C. Song**

**May 1998**

# TABLE OF CONTENTS

<b>I. INTRODUCTION</b>	<b>1</b>
<b>II. HISTORICAL CONTRIBUTIONS TO THE ARMY AND THE NATION</b>	<b>1</b>
<b>III. CURRENT USACE CONTRIBUTIONS AND THEIR RELEVANCE TO THE ARMY AND THE NATION</b>	<b>4</b>
<b>Civil Works Program</b>	<b>5</b>
Business Functions	
Success Stories: Peacetime Support; Wartime Support; Post-Conflict Support	
<b>Military Programs</b>	<b>7</b>
Military Construction Programming and Execution	
Successes and Challenges	
<b>Environmental Programs</b>	<b>9</b>
Formerly Used Defense Sites (FUDS)	
Installation Restoration Program (IRP)	
U.S. Environmental Protection Agency (EPA) Superfund Program	
Interagency Environmental Assistance Programs	
Base Realignment and Closure (BRAC) Cleanups	
Defense and State Memorandum of Agreement (DSMOA) Program	
Formerly Utilized Sites Remedial Action Program (FUSRAP)	
<b>Installation Support</b>	<b>13</b>
A Business Concept for Installations	
<b>Research and Development</b>	<b>15</b>
The Four Laboratories	
<b>IV. THE CHANGING ARMY—EMERGENCE OF FORCE XXI</b>	<b>17</b>
Overview—Force XXI: The Army Moves Toward the 21 <sup>st</sup> Century	
Enforce XXI: The Engineer Regiment as Part of Force XXI	
<b>V. GAP ANALYSIS</b>	<b>18</b>
Customer Surveys	
Customer Interviews	
<b>VI. RECOMMENDATIONS</b>	<b>25</b>
Invest in People	<b>28</b>
Revolutionize Effectiveness	<b>32</b>
Grow the Program	<b>36</b>
<b>VII. CONCLUSION</b>	<b>38</b>

# **U.S. ARMY CORPS OF ENGINEERS**

## **RELEVANCE TO THE ARMY AND THE NATION PEACETIME AND WARTIME**

### ***I. INTRODUCTION***

The Vision Statement of the 49<sup>th</sup> Chief of Engineers, Lt. Gen. Joe N. Ballard, endeavors to move the Corps of Engineers to become "...a vital part of the Army...the Engineer team of choice...and a values-based organization."<sup>1</sup> Although we do a great amount of valuable work for the nation and others, it is critical that Corps activities remain relevant to the soldier and the Army of the future if we are to achieve the Chief's vision. Because the Army is in a constant state of change, it is imperative that the Corps plan ahead so that it is serving not only the Army of Today, but it is also adjusting to serve Force XXI and the Army After Next.

The Chief has a unique perspective from which to implement his vision. His command is an integral part of the Army and he serves on the Army staff. As the Army's senior Engineer, the Chief works with the rest of the Army staff and other commands to insure that combat engineer units are equipped, organized and manned properly. He supervises the development of concepts, plans and policies for engineer support of the Army, including preparation of the Corps of Engineers for mobilization and the construction workload that would follow. The Chief also has staff responsibility for Army military construction, family housing, facility engineering, real property planning, acquisition and disposal, and environmental activities. The key alliances in our service to the soldier and the Army include the Directors of Public Works and the Combat Engineers Battalions.<sup>2</sup>

This paper has four major sections: a brief description of historical contributions of the Corps to both the Army and the Nation, so we can develop a sense of where we have been; a discussion of current services, so we can see how much we have changed from our beginnings; an analysis of Army needs not currently being met, or which may not be met in the future; and, recommendations to gain future relevance to achieve the Chief's Vision.

### ***II. HISTORICAL CONTRIBUTIONS TO THE ARMY AND THE NATION***

Two focal points of the Chiefs Vision – to be a vital part of the Army and to be the Engineer team of choice, responding to our Nation's needs in peace and war – are

---

<sup>1</sup> "Strategic Vision", U.S. Army Corps of Engineers, 1997.

<sup>2</sup> EP 360-1-22, August, 1988.

derived, in part, from the rich heritage of service the Corps has provided the Nation during its 229 years of existence.

The Revolutionary War was primarily a defensive struggle in many of its early stages, with the initial objectives of the Colonial Army being prevention of British attainment of new ground. This objective carried over during the threat of war in the 1790's. The Corps of Engineers initial missions, therefore, were to prepare fortifications and other defenses around harbors and other strategic emplacements. The military mission, which also included battlefield surveys, detailed mapping, fortification design, and transportation systems for logistical purposes, expanded as the Nation grew because Corps officers were among the few individuals in the colonies trained in the engineering skills necessary for westward expansion in a peaceful United States. The new Corps of Engineers, with its school at West Point, could not only provide officers properly prepared to defend the country, but officers who also were in a position to support the Nation's westward growth. From the beginning, the Corps served as a key component of the Army to meet both defense and civil works needs of the Nation.

After the War of 1812, when the British had invaded our shores, Congress indicated that the national defense should consist of: a strong Navy; a mobile Army supported by reserve; defense of the seacoasts; and, improved rivers, harbors, and transportation systems (to gather armed forces quickly). These latter two goals were well matched to the growing Corps of Engineers and their graduating West Point students. In 1819, the Secretary of War, John C. Calhoun, recommended the Corps of Engineers be directed to improve waterways navigation and other transportation systems. Such civil works projects would facilitate the movement of the Army and its materials, while contributing to national economic development. Calhoun reflected that the Government could become more secure through the beneficial effects of wise direction of resources during peacetime.

Congress accepted Calhoun's recommendations and passed a General Survey Act on April 30, 1824. This Act authorized the President to use Army engineers to survey road and canal routes of national importance, from either a commercial or military standpoint. A month later, on May 24, Congress appropriated \$75,000 for improving navigation on the Ohio and Mississippi Rivers, allowing the President to employ "any of the engineers in the public service which he may deem proper" for the work. By 1829, Army engineers were using snagboats to remove obstructions in river channels. This early activity marked the beginning of the Corps civil works mission - a dual role that emphasized blending of civil works and military engineering skills, and fostering the development of a federal agency prepared to shoulder the engineering burden for the country in the event of war or national emergency.

In 1846, at the advent of the Mexican War, the first regular company of engineer troops was authorized. During the Civil War, this company was initially expanded four-fold, constituting one battalion, and, in 1863, the Corps of Topographical Engineers was integrated into the battalion. These troops constructed roads, bridges, palisades, canals, fortifications and even a church during the course of the war. They cleared obstacles and erected field fortifications. Engineer officers commanded combined troops, conducted surveys and reconnaissance and directed siege operations. A fifth regular army company of engineers was created after the war, and, in the ensuing decades, engineer troops, in

addition to their work at numerous civil works and fortification sites across the country, also performed many other disparate functions, even including riot control during the railroad strikes in 1877. During World War I, engineer regiments (1,660 men) became part of each Army combat division. Both in combat (the first tank units; chemical warfare munitions) and in such activities behind the lines as constructing ports, storage depots, hospitals and barracks, the Corps performed a greater diversity of military services than ever before.

After the Great War, focus returned to the civil works mission. At the turn of the century, Congress had responded to renewed interest in waterborne transportation by authorizing navigation projects designed to create an integrated system connecting inland areas with coastal harbors. Then, in 1927, Congress authorized the Corps to survey the nation's navigable streams to formulate plans for navigation, flood control, hydropower, and irrigation. The "308" reports, as they were known, indicated much need for development on the tributaries. The 1936 Flood Control Act recognized that flood control was a major activity of the Federal Government.<sup>3</sup>

These two authorizations placed the Corps of Engineers firmly in the civil works business. Over the years, the Corps constructed approximately 400 reservoirs for flood control and multiple purposes. Commercial use of the 25,000 miles of inland and intracoastal waterways has increased dramatically in recent years; nearly one-sixth of all intercity cargo is transported by water. Waterborne commerce is recognized by experts to be the least expensive and least energy-consumptive means of transportation. The benefits from completed multi-purpose reservoirs and navigation projects continue to play a key role in support of America's economic well-being. The economic base of the Nation continues to be enhanced by these projects. An efficient system of interconnected waterways has also proven to be a key factor in America's ability to mobilize in the event of war.

While combat engineers continued their battlefield and behind-the-lines support in World War II, growing to a force of nearly 236,000 in an army of 1.45 million, a singularly important event for the Corps also occurred in 1941. The Army's and the Army Air Corps' military construction mission was given by the War Department to the Corps of Engineers, rather than the Quartermaster Corps, at the advent of World War II. This decision was instrumental to the successful pursuit of the war effort. As LTG Leslie R. Groves said, "Mobilization was decisive and construction generally controlled mobilization." A summary of this massive accomplishment shows the wartime mobilization effort, including both military and industrial requirements, completed more than 27,000 projects, at a cost of \$15.3 billion. This important mission has since grown to include the Air Force and other federal agencies, most notably NASA.

The Corps has been involved in the regulation of obstructions to navigation since the 1870's, when bridge construction began to be reviewed to prevent navigation hazards. In 1899, Congress gave the Corps the authority to regulate almost all kinds of obstructions to navigation. Since the advent of the Clean Water Act in 1968, the Corps of Engineers has had the regulatory responsibility for enforcing the provisions of both Section 404 of

---

<sup>3</sup> EP 870-1-45, "The History of the U.S. Army Corps of Engineers", January 1998.

the Clean Water Act and, as in prior years, Section 10 of the Rivers and Harbors Act of 1899. Both of these Acts regulate the disposal, alteration and filling of waters of the United States. The Corps planning and regulatory groups have worked closely with Army and Air Force installations in the continuance of work on those installations to insure compliance with the requirements of both Acts. This same environmental expertise has served the Army during its installation cleanup activities during the 1980's and 1990's. Advance coordination and modification of work involving waters of the U.S. have served to avoid many impacts upon installation management, upgrade and planning activities.

The National Emergency Preparedness Program (NEPP) was developed to respond to major emergencies having an impact on our nation's security. It was designed to meet defense and essential civilian needs during national security and major domestic emergencies, with support plans that can be implemented both here and abroad. In 1978, the Corps became more actively involved in mobilization as a result of mobilization exercise Nifty Nugget, which revealed that the Corps was not well prepared to mobilize. In 1980, the Corps established separate Emergency Management offices at each district and division to manage the NEPP. Formal mobilization plans were developed to facilitate better and more rapid response to our mobilization and continuity of operations missions. Since about 1990, the NEPP program has increasingly become less involved in mobilization and more involved with planning response to natural or man-made catastrophic disasters having national implications, including providing support to others for dealing with domestic disturbances, earthquakes, flood or drought, and control of certain hazardous materials. Corps support capacities that can be made available to both the military and public sector are emphasized.

### ***III. CURRENT USACE CONTRIBUTIONS AND THEIR RELEVANCE TO THE ARMY AND THE NATION***

The mission of the U.S. Army Corps of Engineers is to provide quality, responsive engineering service to the Nation. The Corps plans, designs, builds and operates water resources and other civil works projects, manages military design and construction programs for the Army and Air Force, and provides design and construction support for other Defense and Federal Agencies. The Corps is organized geographically with one headquarters, 8 divisions, 41 subordinate districts and 4 laboratories throughout the world, employing approximately 39,000 civilians, of which about 12,000 are engineers, and 600 military members<sup>4</sup>. The Corps employs private architectural, engineering and construction firms for much of its design and all of its construction work.

---

<sup>4</sup> "U.S. Army Corps of Engineers Corps Intelligence Information: Strategic Analysis, Performance Analysis, Execution Review", prepared by the Business Practices and Program Evaluation Division, CERM-O, 1998.

## Civil Works Program

The Civil Works program maintains an engineering workforce experienced in large scale design and construction which exists at no cost to the Army and is available whenever and wherever it is needed. Civil Works also provides a widely focused training base for engineers and other professional disciplines that is often called upon to support both national, and DoD, objectives and those of U. S. allies. Fairly recent examples have included the U.S. Postal Service Construction Program, the Saudi Arabian Construction Program and the construction of airbases in Israel following the Camp David Peace Accord. This workforce also contributes significantly to the government's response to natural and manmade disasters.

The Corps currently possesses a presence in 86 countries, 35 of which include civil works assets. The Corps Civil Works program consists of 174 military personnel (end strength) and 26,050 civilians. The Civil Works program is represented across the nation in 8 Divisions and 38 Districts, further dispersed across 456 reservoir and lock and dam project offices (and not including numerous construction project offices). Civil Works competencies are generally the same as those for Military Programs, with some tailoring for the special needs of the Civil Works mission. They include:

Planning, design, and construction	Real estate management
Project management	Engineering and materials technologies
Contingency and disaster response	Operations and maintenance
Environmental services	Contract specialization

Business functions of the Civil Works mission include:<sup>5</sup>

Navigation. The navigation program includes 299 of the nation's deep draft and 627 shallow draft harbors, and approximately 12,000 miles of commercial navigation channels. The navigation program accounts for approximately 31% of the FY 97 Civil Works program budget authority.

Flood Damage Reduction. The Corps operates 383 reservoirs for flood damage reduction and has constructed about 8,500 miles of levees and floodwalls, most of which have been assigned to non-federal sponsors for operation and maintenance. The flood and storm damage prevention program prevented \$5.65 of damages per dollar invested for the period from 1928-1996. This program accounted for 27% of the FY 97 Civil Works program budget authority.

Environmental Protection. The Water Resources Development Act of 1996 made environmental restoration an authorized project purpose, and this function includes the areas of ecosystem restoration and environmental mitigation, stewardship and compliance. Over 6% of FY 97 Corps Civil Works expenditures were for some form of environmental protection.

Regulation of Work by Others. The Corps regulates work by others in navigable waters and wetlands of the United States. This program was only about 2% of the total Corps

---

<sup>5</sup> U.S Army Civil Works Programs, 1998, Publication of USACE Institute of Water Resources, USGPO: 1998-618-395/90617.

FY 97 Civil Works budget authority. During 1997, the Corps issued 4,676 individual and letter permits, denied 203, authorized another 77,900 activities through regional and nationwide permits, and permitted activity in 34,700 acres of wetlands. However, restoration or creation of 53,400 acres of wetlands was required to offset the impact of those activities.

Emergency Operations. The Corps emergency management mission provides capability for the Army to take a proactive role in national and natural disaster preparation, response and recovery. The Corps responded to 8 natural disasters in FY 97 (13 in the past 3 years). The emergency management program utilized about 9% of Civil Works program budget authority in FY 97.

Support For Others. The Corps has lent support to other Federal agencies, states, and other political jurisdictions who do not possess the technical expertise to coordinate in-house engineering programs. Much of this work has been in support of environmental protection or restoration programs. This accounted for about 15% of the FY97 Civil Works budget.

Other Civil Works Functions — In addition to the 6 primary Civil Works business programs, the Corps utilizes its water resources projects for the additional purposes of hydropower generation, water supply and recreation. The Corps produces 24% of the nation's hydroelectric power and 3% of total power for the country at 75 projects nationwide. The Corps also provides municipal and industrial water storage at 118 of its projects and irrigation at 68 projects. Finally, the Corps serves as custodian to 11.7 million acres of land. It has 4,330 recreation sites at 456 civil works projects that attract more than 376 million visits annually (about 10% of the U.S. population in 1996 visited a Corps project). Together, these three programs accounted for about 10% of the Civil Works budget authority in FY97.

Following are some examples and success stories of Civil Works support to the Army and the Nation.<sup>6</sup>

*Peacetime Support:*

Ecuador: In 1993, SOUTHCOM requested assistance when a mudslide formed a natural dam and river water collected behind it, risking collapse and endangerment to several thousand people living downstream. A Mobile District team evaluated the structure, determined that the dam was stable and provided training to Ecuadorian personnel in computer modeling techniques of potentially affected areas.

Disaster Response: The Corps has supported the Nation in a wide range of disaster relief missions to include crisis management teams, damage assessments, and backfill/replacement of line troops. The Corps has responded to disasters ranging from terrorist attacks to floods, blizzards, fires, and earthquakes. Some of the more notable have included: the Great Western Floods of '94; the World Trade Center bombing; Hurricane Andrew recovery; the Northridge, CA, Earthquake; the Midwest Flooding of '93 and '95; and the Chicago Tunnel Flood. The Corps also responded to the Oklahoma City Bombing, with Urban Search and Rescue Teams (USRT), supporting the Director of

---

<sup>6</sup> "The U.S. Army Corps of Engineers—A Vital Part of America's Civil Works Missions in Support of the Army and national Security", ESSC, 30 December 1996.



Military Support (DOMS) and FEMA, and structural engineer evaluations during the early stages of the emergency.

*Wartime Support:*

General capabilities include combat mobility analysis through laboratory personnel who provide soils and geotechnical expertise; Contingency Real Estate Program team (CREST) facilities support, land, and infrastructure ahead of/for deploying forces; rapid runway repair technology.

The Han River Control System, Korea, was developed to counter a threat from North Korea. A Peace Dam was built prior to the '86 Olympics. The Waterways Experiment Station, in cooperation with the Pacific Ocean Division, developed a model to assess the threat and trained South Korean engineers on how to control flooding through the system's existing dams and reservoirs.

Desert Storm: The Corps provided extensive topographic support to the Commander in Chief (CINC) and field commanders. The Topographic Engineer Center, Survey Division, 30<sup>th</sup> Topographic Battalion, mass-produced large-scale maps of Kuwait City. The Coastal Engineering Research Center (CERC) provided coastal dynamics support to select optimum landing sites.

*Post-Conflict Support:*

Kuwait Clean-up: From October 1990 through December 1993, a combined Civil Works and Military Programs team, consisting of nearly 180 personnel at peak, provided civilian and military infrastructure repair valued at approximately \$475 million.

Archaeological Support to the Army: Recovery and assistance in identification of U.S. remains in Southeast Asia. The St. Louis District has coordinated over 60 of these missions since 1994, providing technical assistance in excavation and recovery at crash sites throughout the theater of operations.

**Military Programs**

The complexity of the battlefield has steadily increased due to advancement in technology. In addition, soldiers' socio-cultural attitudes have changed along with those of our society. On 23 April 1992, at Fort Leonard Wood, MO, General Gordon R. Sullivan, then Army Chief of Staff, remarked: "Today, we are building toward a vision of America's future Army. Our vision is: A Total Force, trained and ready to fight; Serving America at home and abroad; A strategic force capable of decisive victory." Regarding some of the important issues the Corps of Engineers would face in the coming years, General Sullivan commented, "Ask yourself how you can best integrate your essential capabilities into the fight, to include the capabilities of your combat, topographic, and heavy units -- as well as your district offices and project offices. Discuss the modernization efforts, roles and missions that support our overall vision for the Army."

The U.S. Army currently has thousands of soldiers deployed in 77 countries throughout the world, protecting U. S. interests and promoting global stability and peace. As the

fulcrum for the Full-Spectrum Force, the Corps serves the Army in times of peace and war. The Corps is responsible for design and construction of the Army Military Construction (MILCON) program and major portions of the Air Force MCAF program, providing ranges, barracks, and training components. Equally important are the quality of life facilities provided soldiers, airmen and their families around the world. The Corps provides real estate services for more than 12 million acres of land where Army and Air Force installations are located. Corps Districts also substantially support Army Directorates of Public Works (DPW's) in the management of Army installations.

Military Construction Programming and Execution. MILCON programming involves a sequence of reviews by HQDA, the Office of the Secretary of Defense, the Office of Management of Budget, and Congress. The MILCON programming process takes place through four years: the Guidance Year, Design Year, Budget Year and the Programming Year. Like other defense programs, MILCON is included in the DoD planning, programming, budgeting, and execution system, which projects total defense programs and resource requirements at least 6 years into the future.

Installation facilities are grouped into the five broad areas of: Mission Facilities, Strategic Mobility Facilities, Housing, Community Facilities, and Utility Systems. All support facilities must be maintained, updated and modernized to be responsive to the needs of the modern and evolving Army. For example, in recent years, funds for the Barracks Upgrade Program have been increased substantially to rapidly provide better living facilities for soldiers. On the other hand, the Whole Barracks Renewal program will require a ten year investment exceeding \$4 billion, phasing in both new construction and renovation or conversion of existing barracks.

The military project life cycle can be divided into three phases: project formulation, design, and construction. USACE services for each phase include:

*Project Formulation (Programming):* DD 1391 Program Estimating; Master Planning; District support.

*Design:* In-house and A-E, including designs and specifications, technical reviews, foundation-material component, surveys, planning, project management, and complete technical and support staff required for timely and successful design of major construction. The Corps can quickly provide standardized designs for Army facilities, such as the institutionalized standardization of the upgrading of barracks. An important component of the Corps review of any design is the Value Engineering (VE) study of the project (the Corps accomplished \$118.8 million VE savings in 1996). Finally, in this phase, the Corps prepares final plans and specifications.

*Construction Management:* The Corps provides contract administration; assurance of quality, schedule, and contract provisions; provision of as-built drawings; real estate transfer; and warranty enforcement.

USACE also provides extensive contracting and real estate support services to Army and Air Force installations. Services include:

*Contracting:* The Corps provides Supplies and Services Contracts; Indefinite Delivery, Indefinite Quantity (ID/IQ) contracts from which installations can order services; Architect/Engineer Contracts; and Materials contracts.

*Real Estate Support:* Includes assisting installations in leasing and outgranting programs; managing timber harvesting programs; preparation of site selection studies for U.S. Army and U.S. Air Force Reserve Centers; negotiating mineral activities with private interests; disposal certification for the base closure initiative; research and preparation of real estate reports required for the expansion, modification or disposal of existing installations, or for the acquisition of new installations; acquisition of real property by purchase, lease or condemnation; and, negotiation of Army leases, including identification of both the lessor and the premises to be leased, establishing detailed lease provisions, terms, and appraisals for fair and reasonable payment.

Successes and Challenges: The Corps has countless success stories in support of rapid Army deployment and execution of military program projects. Each military support district has an honor roll of military support successes. In the overall context of FY97, for example, the Corps executed 96% of the total MCA program (an all-time record) and 97% of the Barracks Upgrade Program, an installation support program in its first year. Design costs were also decreased from 8.3% in FY 95 to 8.0% in FY 97, due to improved effectiveness in project management and design.

Nonetheless, the military construction program is decreasing and the Corps is downsizing and striving to meet cost (P&D, S&A), time (program design and award), quality and other business targets (TLM, overhead, A/E contracting out percentages, contracts financially complete). The Corps will need to constantly reinvent itself to remain a leader in a competitive industry with increasingly sophisticated customers and a military command that is concerned about the amount of funds that must be used for installation modernization and maintenance.

## **Environmental Programs**

The USACE provides comprehensive environmental services to its DoD customers and other federal agencies. It also provides environmental and other technical services to states and U. S. territories. Environmental support is organized into specific program areas to serve program customers, develop program-specific expertise, manage funds, allocate resources and provide guidance. The environmental services programs managed by the Corps include:

Formerly Used Defense Sites (FUDS)  
Installation Restoration Program (IRP)  
EPA Superfund Support  
Interagency Environmental Assistance

Base Realignment & Closure (BRAC)  
Cleanup  
Defense and State Memoranda of  
Agreement  
Formerly Utilized Sites Remedial Action  
Program (FUSRAP)

Formerly Used Defense Sites (FUDS). The DoD is responsible for cleaning up contamination of properties that it, or one of its components, formerly owned or leased. As the Execution Agent for DoD, the Corps manages the cleanup of such sites. Cleaning up FUDS is a major undertaking, with 9,029 potentially contaminated sites ranging from military training sites involving ordnance to industrial operations and production facilities containing solvents, organic materials, and petroleum contamination. The Corps is making steady progress. In FY 1996, the Corps executed all scheduled FUDS projects—a total program of approximately \$209 million.

A major program success was realized at the former Stead Air Force Base, Nevada. When Stead AFB was closed more than 25 years ago, its housing units—mostly duplexes and some single-family homes—were sold to private parties. The homes originally had been heated by oil stored in tanks buried in the yards. But in the late 1960's, the Air Force converted the heating systems to natural gas and abandoned the underground storage tanks (UST). In 1992, about 130 UST's were closed in place by filling each one with aqueous cement slurry. Subsequently, the Corps offered to remove any unclosed tanks. Through a Total Environmental Restoration Contract (TERC), the Corps uncovered, removed and disposed of 217 UST's within 10 months and collected and analyzed soil samples from under the 130 tanks that had been closed in place. Within another month, the landscaping was restored around nearly 350 properties affected by the project. The work was completed with essentially no complaints from the homeowners and with positive recognition from the Nevada regulatory agency.

Installation Restoration Program (IRP). Corps Districts clean up active installations in support of the Army's IRP by performing studies, developing designs, and conducting remedial actions. The Army has more than 10,000 IRP sites that may be contaminated with ordnance or explosive wastes, solvents, heavy metals, pesticides, plating wastes, petroleum, oil, lubricants or other hazardous wastes. Those contaminants are located in landfills, UST's, soils, fill materials and aquifers. In FY 1996, the Corps completed all scheduled Army IRP projects, a total program of \$207 million.

In support of the Air Force IRP, the Corps has been cleaning up environmental contamination at more than 25 Air Force bases nationwide. The Air Force reports that it is highly satisfied with the Corps' service. In FY 1996, the Corps executed all Air Force IRP projects, a total program of \$105 million.

The Corps achieved a major IRP program success at Fort Lewis, Washington. For this project, the Corps used an innovative technology, soil vapor extraction/air sparging, to treat contaminated groundwater at Fort Lewis. By using this technology instead of the more standard "pump and treat" technology, the Corps reduced the estimated time for remediation from more than 30 years to under 5 years. In addition, actual operation and maintenance costs are projected to total about \$3 million, rather than the originally estimated \$13 million.

Another IRP program success occurred at Fort Greely, Alaska. The Corps began a multiyear project to remediate the base's fire burn pits, which had been used to train fire department and rescue personnel. Tests revealed subsurface hydrocarbon contamination to depths of 27 feet. It was decided to use "bio-venting", the injection of air into the subsurface to increase biological activity to remediate the site. Because of the high cost

of extending electrical service to the site, the project manager also elected to use solar power to generate the electricity. The innovative use of solar power resulted in substantial cost savings at the installation and has generated significant interest among several state agencies.

U. S. Environmental Protection Agency (EPA) Superfund Program. The Corps provides design, construction, real estate and technical assistance services to the EPA for its Superfund program. EPA was the Corps first major environmental customer and this relationship has continued for more than a decade. The Superfund Program and EPA's support were instrumental in the development of the Corps environmental remediation expertise, which, in return, has served the Army as well, during the Corps execution all of its environmental programs. The Corps' role in the Superfund program has grown significantly, from \$12 million in FY 1982 to \$292 million in FY 1996.

The Bunker Hill Superfund Site was a significant program success. The Bunker Hill mining facility, located in Kellogg, Idaho, was one of the largest and most complex hazardous waste sites in the nation. Closed in 1981, the facility covered 21 square miles, five communities and 1 million square feet of structures, including a lead smelter, a zinc plant, a phosphoric plant, a fertilizer plant and a land fill. The mining and smelting operations contaminated the area with heavy metals, including lead, zinc and cadmium. Because of the serious threat to the safety and health of the community of some 5,000 people, the Corps used the Rapid Response Program (RRP) to initiate demolition of the structures as quickly as possible. A cost-reimbursable contract was then awarded for remediation of the industrial complex. The work at this Superfund site has been characterized by excellence in partnering, project management, construction and innovative cost-reimbursable contracting techniques.

Interagency Environmental Assistance Programs. The Interagency Environmental Assistance program provides Hazardous, Toxic, and Radiological Waste (HTRW) management and other technical services for customers who do not have the in-house capability to meet their own environmental requirements. Through this program, the Corps assists federal, state and local agencies and provides funding for specified activities. At the same time, the agencies retain legal responsibility and control over their environmental programs.

Corps employees provide a federal presence for oversight and other management activities to carry out inherently governmental functions and protect proper taxpayer investments. Private contractors are used to execute most interagency activities. The Corps retains only the minimal design and field review work needed to maintain the technical competence for review of contractors products. As part of its wide range of technical support services, the Corp Districts can offer the following special contracts to their customers:

- Rapid Response Contract for environmental activities that the regulators consider time-critical, such as removal actions, contaminant sampling /analysis, spill response and disposal of HTRW or other hazardous wastes.
- Naturally Occurring Radioactive Materials (NORM) Contract, for removal, transport, treatment and/or disposal of rock, soil or water containing such contaminants as radium or tritium. This capability is useful for sites where

regulators have set cleanup standards lower than the local ambient level of natural radiation.

- Small Project Indefinite Delivery Type Contract, a new contract vehicle for environmental services that cost \$250,000 or less.

Base Realignment and Closure (BRAC) Cleanup. The Corps performs environmental restoration services at Army and Air Force installations affected by the BRAC Program. Working closely with Army and Air Force commands and installations in this complex program, the Corps responds to frequently changing requirements while maintaining demanding schedules for cleanup and property transfer. In FY 1996, the Corps executed all scheduled study, design and remedial action projects, representing a total program of approximately \$192 million.

The March Air Force Base, California, cleanup is representative of many program success stories. March AFB had several sites where it disposed of domestic solid waste, demolition debris, transformer cases, waste oils, solvents, paints, pesticide residues and other wastes resulting from aircraft operations at the base. The Corps developed a plan to consolidate the wastes into two lined cells which would prevent the escape of contaminants into the air, soil or groundwater. The Corps completed the first cell, placing the wastes from six sites into it. The single cell solution was \$30 million less expensive than the alternative of capping and monitoring six separate cells. Equally important, it shortened the cleanup schedule by 3-5 years. This approach enabled the release of 66 acres of land for cleanup and transfer to civilian use as part of the realignment of the base into the smaller March Air Reserve Base.

Defense and State Memorandum of Agreement (DSMOA) Program. The DSMOA Program was established to enhance state and territorial involvement in the cleanup of DoD installations, specifically through the environmental restoration (ER) and BRAC programs. DSMOA maximizes the return on cleanup and makes maximum use of reduced budgets for restoration work. USACE is the DoD execution agent for the DSMOA program. The program reimburses states and territories for services they provide in support of DoD restoration activities. Before the program, many states lacked adequate resources to assist DoD fully with this effort. The investment in DSMOA has resulted in cost avoidance, expedited cleanups and improved community relations. States do not relinquish any of their regulatory rights or obligations when they participate in this program.

Formerly Utilized Sites Remedial Action Program (FUSRAP). From the 1940's through the 1960's, work involving radioactive materials was performed at many sites throughout the United States as part of the Nation's early atomic energy program. The activity at some sites can be traced back as far as World War II and the Manhattan Engineer District (MED). Other sites were the result of peacetime activities under the Atomic Energy Commission (AEC). Both MED and AEC were predecessors of the Department of Energy (DOE).

Most sites that became contaminated during the early atomic energy program were cleaned up under the guidelines in effect at the time. In most cases, those cleanup guidelines were not as strict as today's and trace amounts of radioactive materials remained at some of the sites. Over the years, radioactive wastes were spread to other

locations, either by demolition of buildings, intentional movement of materials, or by natural processes. DOE began the FUSRAP program in 1974 to study these sites and take appropriate cleanup action. When a suspected contaminated site is identified, old records are reviewed and the site is surveyed. If contamination is found that is connected to MED or an AEC activity, cleanup is authorized under FUSRAP. Some sites with industrial contamination similar to that produced by MED or AEC activities have also been added to FUSRAP by Congress.

Since starting FUSRAP, DOE has examined records or performed surveys on more than 400 sites. Most were not contaminated, but 46 sites in 14 states have been found to be contaminated with radioactivity that exceeds current cleanup guidelines. Limited cleanup began at some sites in 1979 and major remedial action has been under way since 1981. Cleanup has been completed at 23 of the sites and 19 others have been partially cleaned. More than 175 vicinity properties, including homes, parks and streams, have also been cleaned.

The FY 1998 Energy and Water Appropriations Bill transferred management of the FUSRAP, which had been managed by the DOE prior to now, to USACE. The legislation provides \$140 million in FY 1998 funding, or approximately twice the amount appropriated in FY 1997. LTG Ballard has recently commented, "...the fact that Congress gave it to us shows that we have the reputation for getting things done and done right."

### **Installation Support**

In this era of a downsized Army and Enforce XXI, the type and extent of USACE support to installations has been increased to supplement diminishing installation engineering resources. This changing role of the Corps is best evidenced by formation of a new directorate within HQUSACE, the Center for Public Works. What began as a few individuals serving as liaisons to Directorates of Public Works (DPW's), grew into a multi-faceted organization, incorporating the elements of Customer Relations, Army Power Procurement, Power Reliability Enhancement, the 249<sup>th</sup> Engineer Battalion, Engineering, and Facilities Management. The Center's primary mission is to provide public works guidance, support, and services to Army installations around the world.

Installation Support provides enhanced mission support capability through access to the Corps engineering capability, specialized A/E contracts, supplemental technical capabilities and expanded manpower capacity to supported installations. It can provide high-quality, easy-to-maintain products, services and facilities that support DoD missions, soldiers and families. Installation Support services include planning, engineering, design, real estate, environmental, contracting and construction management.

**A Business Concept for Installations.** Although Installation Support is sometimes perceived as a USACE program, in reality, it is intended to be a program for installations. Its original purpose and intent remain the same -- to have USACE activities consistently provide quality, responsive and cost effective engineering and technical support to installations. In a Direct Support District, a request from an installation is given a

priority indicative of the Corps vision: “to be the professional team of choice, providing quality engineering and technical services focused on customer satisfaction.” It is a business concept focused on providing enhanced mission support capability, supplemental technical capabilities and expanded manpower capacity to the installation, when needed.

Installation Support begins at the installation. Specific USACE support is initiated by the installation, at their direction, usually when it’s determined that the service or task required exceeds installation in-house professional or technical capabilities and because USACE Districts and laboratories have specialized personnel, capabilities and services not ordinarily available at the installation. As a member of the Total Army engineering team, USACE Districts serve as a partner in the shared mission to maintain facilities and installations for the good of our service members and their families.

Successes. Traditionally, USACE Installation Support services were an element of Military Programs project design and construction and consisted of planning, environmental, engineering, real estate, contracting, construction management, and other services as required for a particular program or project. This support, while efficient for the larger, MILCON projects, proved to be inefficient and expensive for much of the Installation Support work. Now, however, Corps Districts are adjusting to provide services historically provided by DPW’s, such as routine operations and maintenance, rehabilitation, renovation and small-scale project construction. A success story illustrating this new partnership is the test partnership formed in October 1997 between the Rock Island Arsenal (RIA) and the Rock Island District. Under the terms of the partnership, “the Rock Island District will take over the day-to-day operations of most the functions now performed by the RIA DPW. The Arsenal Commander will retain responsibility for planning, programming, budgeting, funding and setting priorities for public works requirements on the installation.”<sup>7</sup> This allows the District “to consolidate certain engineering functions into one organization, with the goal of achieving efficiencies and improving services.” These functions include “management, contract oversight and engineering support in areas of such as the construction, renovation and repair of buildings, roads, grounds, and other real property assets; utilities; snow removal; environmental compliance; historic preservation, janitorial services; and pest control...the Arsenal was not ceding control of public works and would still make management decisions and set priorities in the DPW arena.”<sup>8</sup> Noteworthy in this partnership is that nearly 90 percent of the DPW employees have been detailed to the Rock Island District, working as a separate project office under the District’s Operations Division, illustrating an effective leveraging of resources. Audits will be conducted before and after the test to insure that projected cost savings are realized. According to Mr. Dan Holmes, Rock Island District’s primary liaison, the partnership’s ultimate test will be measured “If the people at the Arsenal are happy with the services they receive...then we’ll know that we succeeded.”<sup>9</sup>

---

<sup>7</sup> TARGET, “Corps-Arsenal Partnership Covers Public Works Functions”, Paul Levesque, 1998.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.



## **Research and Development**

The Corps is prepared to respond to the needs of the engineer soldier on the battlefield. The research and development mission of the Corps of Engineers is comprised of four primary areas: combat engineering; environmental quality; base support; and, civil works. To accomplish this mission, the Corps operates four laboratories, performing specific technology research in the following functions:

- Mapping, terrain analysis and image processing systems and techniques.
- The design, construction, operation and maintenance of the Army's infrastructure.
- Methods for living, working, fighting and navigating in the world's cold regions.
- Improvement in water-related structures, hydraulics, and geotechnical, coastal and environmental engineering.

Waterways Experiment Station (WES). The largest of the four laboratories, WES is located in Vicksburg, Mississippi. Established in response to the Mississippi River flood in 1927, WES was charged with assisting the Mississippi River Commission's development and implementation of a flood control plan for the lower Mississippi Valley. WES has since grown into perhaps the most sophisticated hydraulics research facility in the world, with over 1,400 employees responsible for the management and execution of about 85% of the USACE Civil Works Research and Development Program. Six subordinate, interrelated laboratories carry out WES research: Hydraulics, Coastal Engineering, Geotechnical, Structures, Environmental, and Information Technology. Primary research and development missions include:

- Military strategy: weapons effects; fighting positions; terrorist threat protection; obstacle creation and reduction; fixed facility camouflage, concealment and deception; vehicle/terrain interaction; military hydrology.
- Construction and repair of lines of communication, airfields and pavements.
- Coastal engineering; hydraulic engineering; flood control and navigation; dynamic modeling and simulation; environmental impact and groundwater modeling; wetlands processes; environmental site characterization; ecosystem processes; reservoir, riverine, estuarine and coastal water quality.
- Seismic response of structures; earthquake engineering.
- Dredging and dredged material disposal; natural resource management; concrete technology; structural dynamics; and geotechnical engineering.

Cold Regions Research and Engineering Lab (CRREL). The Cold Regions Lab is a unique laboratory facility that addresses the problems and opportunities of the world's cold regions. CRREL, in Hanover, NH, exists largely to investigate the technical problems that develop in cold regions, especially those related to construction, transport, and military operations. Nearly half of the earth's surface is subject to snow, ice, and seasonally frozen ground; 20% is underlain with permafrost, and 10% of the world's oceans are covered with ice. Due to the strategic importance of some of these cold

regions, as well as their potential for yielding natural resources, insight into these areas is of great importance to the DoD and the nation. The mission of CRREL is to gain knowledge of the cold regions of the world through scientific and engineering research, including the mechanics of snow, ice and permafrost. With its predecessor organizations, CRREL has been in existence for forty years, and has been involved in nearly all of the nations' major cold regions ventures during that period. CRREL provides its services in three primary areas:

- cold traditional military engineering, which deals with problems that arise during conflict.
- military construction and operations technology, such as the building and maintenance of military bases, airfields, roads, ports, and other facilities.
- civil works, which involves navigation on inland waterways, coastal engineering, and weather engineering problems.

Construction Engineering Research Laboratory (CERL). CERL, in Champaign, IL, is the lead Army facility for conducting research and engineering studies on materials, energy, construction management and environmental quality. CERL's mission is to:

- perform infrastructure and environmental sustainment research and development, and provide technical assistance leading to a quality trained and ready Army.
- set the standard in preserving and protecting the nation's land, water, and cultural resources.
- repair, maintain, and rehabilitate civil works facilities.
- enhance engineer capability to deploy rapidly and to sustain a full range of military operations.

Soldier Quality of Life is the newest focus of CERL research. It is aimed at improving the morale of troops and their families. Sustainable neighborhood design and construction and quality of life issues are being addressed. Other research areas include divestiture options for welfare, recreational, childcare, and religious facilities, and technology infusion into the barracks improvement program.

Topographic Engineering Center (TEC). The traditional mission of the TEC, located at Fort Belvoir, VA, has been to provide soldiers with superior knowledge of the battlefield, and to apply relevant technology to solve civil works problems of the Nation. To accomplish this mission, TEC has developed knowledge and research capability in fields which make extensive use of remote sensing technologies and spatial data development and generation. These include:

- terrain analysis and characterization, passive and active spectral signature identification.
- photogrammetry, battlefield viewing, battlefield and terrain-related simulation and modeling.
- precision surveying and mapping, high accuracy global positioning system (GPS) research, image analysis, geographic information systems (GIS), and data/image infusion.

One of many success stories of the Corps' Research and Development mission is the Los Angeles County Drainage Area Model Study conducted by WES's Coastal and Hydraulics laboratory. A 1992 feasibility study indicated that 27 bridges needed to be raised to prevent future flooding at a projected cost of more than \$500 million over a ten-year construction period. WES built five physical models of the drainage system to find a way to improve the flood carrying capacity of the Rio Hondo Flood Control Channel and the Los Angeles River. The models revealed that modifications to the existing bridge piers would allow a flood to safely pass most of the problem bridges. Estimated project cost was reduced to \$240 million over a seven-year construction period with fewer construction-related traffic problems. The \$260 million savings represent a 7,000 percent return on the research investment. Implementation of some of the earlier changes recommended by WES is underway.<sup>10</sup>

#### ***IV. THE CHANGING ARMY - EMERGENCE OF FORCE XXI***

##### **Overview—Force XXI: The Army Moves Toward the 21<sup>st</sup> Century**

Chief of Staff of the Army, General Dennis J. Reimer, defines the vision of today's Army as:

“A Total Force of quality soldiers (active and reserve) and civilians that is a values-based organization; an integral part of the joint team; equipped with the most modern weapons and equipment our Nation can provide; able to respond to our Nation's needs; and changing to meet the challenges of today....tomorrow.... and the 21<sup>st</sup> century.”<sup>11</sup>

Today's Army recognizes that we face a wide spectrum of unpredictable dangers and threats, compounded by new challenges such as regional conflicts involving advanced, chemical, and biological weapons, and peace keeping operations. According to General Reimer, the Army's most significant challenges are: first, to be trained and ready, even as funding is decreased; second, to be able to return to a stable environment after the changes brought about by the Army drawdown are complete; and last, to achieve greater efficiency and smarter ways of doing business in the future.<sup>12</sup> Force XXI, designed to manage institutional military affairs changes, is the Army's process to meet these challenges. Force XXI defines the Army's plans to move toward a smaller Army that leverages the capabilities of the entire force (Active, Reserve, and civilian), our Nation's industrial base, and academic institutions, to become one Army whose sum is greater than its parts. Force XXI includes such concepts as refining the missions of the active and reserve components, and building increased partnerships with industry.

---

<sup>10</sup> Engineer Update, March, 1997.

<sup>11</sup> Greenbook Article, “America's Army—The World's Best Army. Where We've Been, Where We're Headed”, Dennis J. Reimer, Chief of Staff of the Army, December 1996.

<sup>12</sup> Ibid.

Force XXI is currently under-funded, requiring the Army and its support elements to find new and innovative ways to become more efficient, determine smarter ways to do business, streamline management practices, reduce overhead, increase leverage of outside resources, and eliminate non-value-added programs. Some of these efforts are already underway, including re-engineering at the MACOM level, and the creation of efficiencies within the logistics community. The strategy is to take the savings created in today's operational changes and invest them in the Army's future. Ultimately, if the Army does not become more efficient, it will, of necessity, become smaller.<sup>13</sup>

### **Enforce XXI: The Engineer Regiment Component of Force XXI**

"The United Regiment...A Force Multiplier. Serving Soldiers, the Army, the Nation. USACE is a Regiment in the truest sense of the word—soldiers, civilians, and contractors using their combined talents to bring unique and vital expertise to support the Army and the Nation in times of peace and war." This concept expressed by LTG Arthur E. Williams, former Chief of Engineers, set the stage for the Engineer Regiment's participation in Force XXI. As the Army moves toward Force XXI - a smaller force, heavily leveraging reserve components, civilians, and technology—the Engineer Regiment must move in parallel paths to support the Army. The Engineer Regiment must be trained and ready, a rapidly deployable and versatile member of the strategic force, and be a conceptually unified whole Regiment. The Regiment includes Active & Reserve Component troops, USACE, Installation DPW's, and our private industry contractors.<sup>14</sup> LTG Ballard is rapidly moving the Corps further towards Enforce XXI with his Vision. For perhaps the first time in a Chief of Engineers' vision statement, intent is given, and is clearly expressed, in terms of relevance to the Army, people as resources, customer satisfaction, planning for the future, and teamwork.

## **V. GAP ANALYSIS**

The USACE Regiment serves the Army and its Combat Engineers in many ways through its Civil Works, Military Programs, Environmental, Installation Support, Research and Development, and Real Estate Programs. Since the founding of the Corps in 1779, USACE has continued to evolve to meet the changing needs of the Army, DoD and the Nation. In the past, it has been an acceptable strategy to "be responsive"—to respond to whatever situation was presented. Today, simply to be responsive is no longer a strategy that will generate future success. All organizations, public and private, are in a world where it is important to anticipate the future and to manage change. Those that don't will simply fall behind those that do in an ever more rapidly evolving world. It is in this spirit that we have attempted to interview customers and to review past customer surveys to determine whether we could identify "gaps" in current or desired services and make recommendations on how USACE might evolve to fill those gaps. We analyzed existing customer interviews, and augmented these with current customer interviews conducted by our group members. Following are the analyses of customer needs followed by our ideas to close the identified gaps and increase our relevance to the Army and the Nation.

---

<sup>13</sup> Ibid.

<sup>14</sup> Compilation of Briefings Presented by LTG Williams, MG Genetti, and BG Anderson, ESSC, "One Corps, One Regiment, One Fight", Engineer Strategic Studies Center, December 1996.

## **Customer Surveys**

### **1. Military Programs—Customer Satisfaction Survey Results, 1995-1997**

USACE has conducted three standard customer satisfaction surveys of Military Programs customers. These are well documented.<sup>15 16 17</sup> We will not duplicate these findings, but will extract some trends that seem consistent among all surveys, and provide some customer comments that are repeated by our Army customers across Districts and years.

#### **General Level of Satisfaction (Questions 1-11):**

**Lowest Customer Rating—Cost.** Reasonable Cost for Products and Services. All military customer respondents consistently rated the Corps failure to provide products and services at reasonable cost the lowest of any question. Cost was given a “satisfaction” rating of about average, ranging from 3.1 to 3.2 on a scale of 1 to 5. Though the rating has improved slightly each year from the previous year, it remains significantly lower than all other ratings. Clearly, we must improve either our costs, our customers’ perception of our costs, or both. This is a complex issue.

**Second Lowest Customer Rating—Timeliness.** Provides Timely Service. Again, all military customer respondents rated “timeliness” lower than all other rating areas. The “satisfaction” rating of project timeliness ranged from 3.4 to 3.6. The timeliness rating also improved slightly each succeeding year, but it still remained significantly lower than all other elements rated except for cost. All other element ratings ranged from 3.6 to 4.1 and within any year the lowest other element rated was at least 0.2 above timeliness.

#### **Specific Products and Services (Questions 12-29):**

The lowest ratings for specific products and services were higher than the lowest overall satisfaction ratings, however the bottom 5 services were consistent across all three years. These were, from lowest to highest rating:

- Post-construction support
- Timely completion
- Funds management
- Construction turnover (see also Timely Completion)
- Engineering design quality

Each of these is a specific customer concern and should be relatively easy to pinpoint and correct. It is somewhat of a disappointment that USACE, which takes pride in being one of the premier engineering and construction management organizations in the world, is receiving its lowest scores on the engineering and construction management fundamentals. We received substantially higher scores on such items as Planning

---

<sup>15</sup> “Military Programs, Customer Satisfaction, 1997 Survey Results”, USACE Engineer Strategic Studies Center, October 1997.

<sup>16</sup> “Military Programs, Customer Satisfaction Survey Results”, USACE,, USACE Engineer Strategic Studies Center, November 1996.

<sup>17</sup> “Military Programs, Customer Satisfaction Survey Results”, USACE Engineer Strategic Studies Center, October 1995.

Services, Studies and Investigations, Environmental Compliance, Real Estate Services, Project Documentation, Job Order Contracts, A/E Contracts and Construction Quality. Either we are ignoring the fundamentals or we are not managing perceptions well.

Organizational Level Comparisons (Questions 1-11):

Questionnaire responses were analyzed by organizational level (HQ, MACOM, Installation). Both HQ/MACOM and Installation respondents rated cost and timeliness significantly lower than all other elements measured. It is apparent that this perception is generally held at all military customer levels.

Organizational Level Comparisons (Questions 12-29):

The lowest ratings for specific products and services were consistent among organizational levels for the lowest four services. Post-construction support, timely completion, engineering design quality, and funds management ranked lowest for both HQ/MACOM and Installation respondents. Installations ranked construction turnover lower (5<sup>th</sup> lowest) while HQ/MACOM ranked maintainability as 5<sup>th</sup> lowest in 1997. Generally, the lowest four were consistently in the lowest four for all three years, so again, these perceptions are generally held at all military customer levels.

Overall Satisfaction by Customer Group (Army, Air Force, Other) (Questions 1-11):

Separating the Questionnaires by customer group demonstrates that our Army customers return significantly lower ratings than do our Air Force or our Other (SFO) customers for Question 11, Overall Level of Customer Satisfaction. There could be many reasons for this. Air Force and Other work may be more straightforward. There are fewer projects to manage for these customers. We may put our better project managers and teams on non-Army work. Whatever the reason(s) again, it is somewhat surprising to learn that we consistently satisfy our most important and valued customer the least. Strategically, it appears that from our headquarters leadership to our Districts, we are placing our efforts in the wrong place. Minimally, it seems that the survey responses would cause the Corps, at all levels, to develop a strategy to improve Army customer perceptions. Yet, there is no relative improvement in Army scores from the 1995 to the 1997 survey over those of the Air Force or Other customers.

Comments on Survey—1997:

Customer comments on the 1997 survey forms are revealing. In many instances, they reinforce the ratings. They also add meaning to the survey. The table below categorizes all instances where there was more than one negative comment on a District survey by an Installation respondent on the same subject. This extract is biased since it only records the negative comments. However, the number of comments on some subjects is revealing.

<u>Comment</u>	<u>No. of Comments</u>
Communication needs to be improved	38
Construction Quality is poor	32
Timeliness of construction, mod processing, etc. is poor	28
Cost is too high (may be cost of design, construction or overhead)	20
Funds management is poor	18
Post construction turnover or warranty enforcement is poor	16
Design quality is poor	16
Timeliness of response to requests is poor	6
Project maintainability is difficult	4
Poor quality contractors	3

Conclusions: We can make several general observations about these comments which were all made by installation staff—our most direct customers, the people who assume responsibility to maintain these projects, and the ones we must win over if we are to grow our installation support work in the future.

- It is important to “stick to our knitting.” We are, after all, a design-construct agent and must get this right, first and foremost. There is no excuse for poor quality work.
- Communicate, communicate, communicate. We should pick project managers for their ability to communicate. We should train them to talk and to listen. We should find ways to communicate efficiently and often with standard reports.
- Poor design manifests itself in poor construction quality. We must get both right.
- Funds management needs attention. Many funds management problems were related to communication, that is, our failure to communicate funds status in a timely manner. Surprises are not welcome. As above, we should find ways to communicate efficiently. One customer commented that “The District’s cost accounting system is super. You can tell where the money is and how it is spent.” Whatever this District’s cost accounting system is, it should be exported to the 18 Districts who received negative comments.
- We need to improve post construction turnover and warranty support. This is not a new issue, but it is disappointing to still have it around. Improved design and construction quality would greatly lessen the warranty enforcement problems. This is the equivalent of the “manufacturing defect” problem. Productivity improves dramatically with improvements in quality.

## 2. Civil Works—Customer Satisfaction Survey Results 1995

USACE conducted only one customer satisfaction survey of Civil Works customers.<sup>18</sup> That was in 1995. The Civil Works survey does not lend itself well to item-by-item

---

<sup>18</sup> “Civil Works, Customer Satisfaction Survey Results”, USACE Engineer Strategic Study Center, November 1995.

comparison with the Military Programs surveys because there is only the one, dated survey, and also because of the vast difference in the programs. Most Civil Works customers are customers during the extensive, and perhaps lengthy, planning and design phase, while most military customers are customers during a relatively quick design and construction period. Nonetheless, some comparisons are noteworthy.

#### General Level of Satisfaction (Questions 1-11).

Similar to the Military Programs surveys, questions 1-11 were concerned with overall customer satisfaction. Also, similar to the Military Programs survey outcome, the lowest scores were for Reasonable Cost for Products and Services and Provides Timely Service. The mean responses for these two questions were significantly lower than for all other questions. In addition, Flexibility in Response to Customer Needs was significantly lower than all other questions, but not as low as Cost and Timeliness. Interestingly, the cost and timeliness responses were much lower for headquarters customers than they were for divisions and districts.

The Civil Works Customer Survey did not have additional questions to determine customer response to specific services so there is no basis for comparison between the two surveys beyond the basic areas of customer satisfaction. Although there is a large difference in the types of projects and customer interactions, we attempted to correlate actual customer comments, focusing only on comments made on projects in the planning, design or construction phase. There was remarkable similarity:

<u>Comment</u>	<u>No. of Comments</u>
Communication needs to be improved	50
Cost is too high (may be cost of design, construction or overhead)	38
Timeliness of planning, design, construction process	35
Flexibility	27
Timeliness of response to requests is poor	15
Design quality is poor	9
Construction Quality is poor	5
Funds management is poor	6
Not treated as a Team member	3
Post construction turnover or warranty enforcement is poor	NA
Project maintainability is difficult	NA
Poor quality contractor	NA

Conclusions. We can again draw some general observations from these customer comments. Even allowing for the difference in projects, most comments concerned communication, timeliness, cost and flexibility. A major difference is that design and construction quality was not a major issue—probably because most of the comments were about projects in the planning phase. A fair number of the comments concerning lack of, or poor, communication were associated with a change in District project managers (PM) or with the inability of the PM to manage differences among the functional staff. We anticipate that changes taken since 1995 and the introduction of ER 5-1-11 will go far towards correcting these concerns. Also, several comments about lack of flexibility noted that inflexible Corps Civil Works processes requiring headquarters approval add undue time and cost. Thus, from the customer's view, the principal



disadvantage of inflexibility is its direct impact on project cost and time. While respondents didn't blame the District for these faults, they resented the added time and costs involved, especially for small projects.

Again, lessons learned from these comments are very similar to those from the military programs. The two sets of comments are compared in the table below:

<u>Comment</u>	<u>MP Rank</u>	<u>CW Rank</u>
Communication	1	1
Construction Quality	2	7
Project Timeliness	3	3
Project Cost	4	2
Funds Management	5	8
Post Construction Turnover	6	NA
Design Quality	7	6
Response Time	8	5
Project Maintainability	9	NA
Poor Quality Contractors	10	NA
Flexibility	NA	4
Treated as a Team Member	NA	9

The most interesting observation about this table is that, with two exceptions, the top 8 customer concerns, as expressed by those who took the time to write them down, are the same for both the military and civil programs. While we recognize that we are examining only negative comments (there were 2-4 times as many positive comments as there were negative comments), the consistency of the customer reaction across the programs indicates that these concerns represent structural, process flaws that occur in many districts which should be addressed on a Corps-wide basis. Recommendations on means to address these issues will be provided in this paper.

### **Customer Interviews**

In addition to our review of customer surveys, three of our team members interviewed customers to determine their views on four questions.<sup>19 20 21</sup> These questions were designed to relate to current programs that work well, supplement the Customer Surveys to verify (or not) what is not working so well, and determine areas that the Corps might correct and where it might apply its resources towards future work. The results of these interviews are summarized below.

---

<sup>19</sup> Compilation of Interviews of Several Customers, by Sam Song in June 1997.

<sup>20</sup> Interview of Army Program Manager for Chemical Demilitarization, Anniston Army Depot, by Karen Durham-Aguilera, January 1998.

<sup>21</sup> Interview of Ft. Huachuca, Department of Engineering and Housing Staff, by Dale Mazar, January 1998.

Q1 What products or services does the Corps provide that are of no use?

Need to interface with only one Corps representative; eliminate the additional interface by consolidating PM and TM.  
Air Force MAJCOM can provide its own environmental services. These are free to the BCE.  
Planning services (Air Force). These cannot be delegated.  
Different BOQ designs. Stick with a single design; reduce maintenance, cost.  
Internal Corps Executive Review Group. Have one joint IPR.  
None!  
Slow response time.

Q2 What products or services does the Corps provide that are particularly useful?

In-house design of OMA projects (2 comments)  
Engineering studies, investigations and reports (2 comments)  
Contracting support; construction contract management of OMA projects (2 comments)  
Continued technical support after beneficial occupancy.  
Design and construction of products for the DPW.  
Weekly or bi-weekly project briefings with briefing packets on project status.  
Changes requested during construction. Corps is very helpful in making user-requested changes.

Q3 What help could you use that you are not getting now?

Find better means to ferret out design deficiencies and out-of-scope design elements.  
Better, more timely funds reporting.  
Smaller project design in the <\$100,000 range; Corps takes too long and costs too much.  
Latent deficiencies: DPW has shortage of current year funds to provide for projects funded 2 or 3 years ago with no funding available.  
On-line, real time project status report.  
Timely technical support.  
Better information about the services available from the Engineering and Support Center (HND).

Q4 Any other comments?

Cost of doing business is too high (3 comments)  
Lack of continuity, process differences between different Corps resident offices working on the same programs.

Conclusions: These interviews verify some of the survey information and point the way towards some services we might explore in the future. Our cost of doing business is too high. Four of the five comments concerning services of little value relate to services that add unnecessarily to cost. Further, four of the “other” comments were specific about costs being too high. Cost was the #2 concern of Civil Works customers and the # 4 concern of Military Programs customers who provided comments.

Technical support is our most highly valued service, especially for military customers, who like us to be there when their own expertise is inadequate. Our key value to our customers is our technical capability and we must maintain it at all costs.

Funds management, design quality, and response timeliness, the number 5, 7 and 8 concerns expressed in the 1997 MP Customer Survey are repeated in these interviews.

## ***VI. RECOMMENDATIONS***

Earlier portions of this report identify the many services the Corps of Engineers has historically provided, and continues to provide today, to the Army, the Department of Defense and the Nation in peacetime and in wartime. The questions at hand are whether we are still relevant and whether we will remain so into the 21<sup>st</sup> century.

We clearly are relevant in many ways. In FY97, we provided approximately \$10 billion worth of products and services, of which about 60% were to the Army and DoD, 30% to Civil Works customers and 10% to other federal and local agencies. We have enjoyed many successes in all programs as detailed throughout this paper. Our SFO work, especially, is testimony to our relevance, since these are all customers who could choose any service provider from the government or the private sector. They choose the Corps because we provide more value for the dollar than our competitors. This value, we believe, is squarely linked to two assets: our engineering and construction expertise and our reputation of absolute integrity. Our federal, state and local customers know, with 100% certainty, that their taxpayer/customers will receive a fair value for the dollar invested and that they will never suffer from fraud, waste or abuse in the programs they have entrusted the Corps to carry out on their behalf.

As we sort through our history, our current services and our potential future relevance, we have oriented our recommendations toward those activities that will not only enhance our effectiveness but, at the same time, preserve, maintain and enhance those two key elements of our operations that are central to the Corps historical success: our engineering and construction expertise and our reputation for integrity. Since we have a clear Vision and 3 primary goals, our recommendations are structured to indicate how they support the Vision and those goals. The table below provides a summary listing of the recommendations, indicating the page of text which led to the recommendation, and relating each to the areas the group was directed to address.

## SUMMARY OF RECOMMENDATIONS

	Page Recmndat'n	Functional Area
<b>INVEST IN PEOPLE</b>		
<b><i>Broaden Skills and Perspectives of Current Leaders</i></b>	<b>28</b>	<b>12,15</b>
Mandatory rotational assignments for mid –level managers	28	12,15
Routine cross-functional training programs at Districts	28	12,15
Expand EDP program to GS 12-13	28	12,15
<b><i>Develop and Improve Core Competencies at Selected Districts</i></b>	<b>29</b>	<b>9,11</b>
Focus on core competencies	29	9,11
Audit the location, number and quality of staff with key core competencies	29	11
Promote cross district use and maintenance of core competencies at selected FOA's	29	5,11
Develop a sense of Corps, not District, loyalty among key employees	29	5,7,11
Support high grades for key technical personnel	29	
<b><i>Make Project Management Work</i></b>	<b>30</b>	<b>6</b>
Rotational details for project managers at field offices	30	5,6
Form PM-led working groups across functional disciplines	30	5,6
Colocation of related teams, e.g. A/E contracting with PM team	31	5,6
Realignment at district and project office level for customer support	31	3,9,10
Implement ER 5-1-11	31	6
Provide human relations and communications training to project managers	31	6,15
<b>REVOLUTIONIZE EFFECTIVENESS</b>		
<b><i>Redefine Installation Support</i></b>	<b>32</b>	<b>3</b>
Provide cradle to grave support to Installation DPWs	32	3
Better use of Corps lab revitalization capabilities	32	3,8,13
Leverage District/DPW joint resources to increase timeliness, decrease cost	32	3,7,8
Leverage District/DPW joint resources to improve construction QA	32	3,5,7,8
<b><i>Develop Core Competencies and Strategic Capabilities</i></b>	<b>33</b>	<b>11</b>
Develop core competencies and strategic capabilities	33	11
Eliminate services that do not support core competencies or a customer need	33	11
Centrally invest in, develop and improve key corporate business processes	33	8,11
<b><i>Improve Key Business Processes</i></b>		
Insure cost of doing business is competitive; insure it can be explained	33	8
Provide timely service	33	8
Improve post construction support	34	8,10
Improve funds management and standard funds information for customers	34	3,8

	Page Recomndat'n	Functional Area
<b><i>Seek means to anticipate and respond more quickly to customer demands and program fluctuations</i></b>	34	10,11
<b><i>Improve Customer Support to the Army</i></b>	35	8
Standardize business processes that support a single MACOM	35	10
<b><i>Improve Civil Works Program Flexibility</i></b>	35	8,9,10,14
Decrease Washington level review	35	9
Give District commanders more authority to commit	35	9,10
Establish different processes for small and large projects	35	10
<b><i>Reorient HQUSACE and Divisions to Competency/Capability/Maintenance</i></b>	35	9,11
<b><i>Share Successful Processes, Reports and Procedures across Districts</i></b>	36	7,10
<b>GROW THE PROGRAM</b>		
<b><i>Restructure the Organization to Sustain Core Competencies</i></b>	36	11
<b><i>Seek to Grow Work that Sustains and Grows Core Competencies and Products</i></b>	36	1
<b><i>Redefine Installation Support</i></b>	37	3
Create joint Corps-DPW organizations and support DPW O&M mission	37	1,3
Rethink our traditional DPW support services	37	3
Encourage DPWs to consider non-traditional areas of Corps support	37	3
<b><i>Focus Districts on Marketing, Execution, Customer Support</i></b>	37	9

### **FUNCTIONAL AREAS**

- |                            |                          |
|----------------------------|--------------------------|
| 1. Partnership             | 9. Dist, Div, HQ Roles   |
| 2. Mobilization            | 10. Customer Care        |
| 3. Installation Support    | 11. Technical Competence |
| 4. Performance Measurement | 12. Training             |
| 5. Enhancing Teamwork      | 13. R&D                  |
| 6. PM Role                 | 14. CW Contributions     |
| 7. Regional Village        | 15. Leadership           |
| 8. Value Added             |                          |

## RECOMMENDATIONS

### Invest in People

#### *Broaden Skills and Perspectives of Current and Future Leaders*

Increasing institutional perspectives and achieving personal growth are essential in gaining, and then maintaining, relevancy to the Army in today's dynamic environment. However, it is common for many of our current and future leaders at the GS-12 through GS-15 levels to work and be promoted within one stovepipe or organization for much of their careers. Frequently, the result is stagnation, a dearth of innovative thinking, and a lack of vision and perspective on how to improve our business processes and products. There is little or no thinking in the "corporate" perspective. Our recommendations apply to the Corps current situations, regardless of specific program. We propose to help close that gap as follows:

Require mandatory rotational assignments for mid-level leaders. The Corps is now operating in this manner with Senior Executive Service (SES) personnel, but unlike private sector mid-to-high level managers, the majority of our GS-14's and GS-15's may stay in one job or district for many years. Once an individual reaches this level, after duration of two-to-three years in one assignment, he/she should perform a detail at another location, and preferably in another stove-pipe, for a duration of six-to-nine months. The detail should not be limited to the Corps, but may occur as well in other SFO or Army organizations, especially installations. Such details serve not only to train potential leaders, but also to test their performance in a variety of situations and to test their resolve to accept similar assignments at the SES level. The Corps will gain re-energized employees with increased vision, enhanced perspectives of different sides of the Corps and the Army, capable of developing new and better ways of doing business.

Provide routine cross-functional training programs within Districts. The skill levels and business acumen of personnel at any grade level can be increased, without expenditure in funds, by cross-training opportunities between functions. Managers are usually reluctant to make high performers available for training when it temporarily impairs their efficiency. This program can work, as evidenced by New Orleans District's cross-training program, initially conducted for GS-13's in the CP-18 program.<sup>22</sup> Participants came away "more sympathetic...[with]...a much greater appreciation and bigger-picture image of the district," and, obviously, rendering them more competitive as well. Expansion of this type of program into various grades and functions will help achieve a corporate culture and a developed workforce of increased enthusiasms and talents.

Expand the Executive Development Program (EDP) to GS-12's and above. This method to further our skills and capabilities has already been announced by the Corps' HQ, with the reorientation of the EDP to the GS-12/13 grade levels, with the opportunity for developmental assignments in other Army organizations. It is vital for the Corps to recognize that we cannot develop diverse and talented leaders at the GS-14/15 levels, if

---

<sup>22</sup> "Engineer Update", Volume 21, Number 10, October 1997.

we do not place our most promising candidates into the key, supervisory GS-13 and 14 positions that will make them eligible to compete for the senior GS-15 and SES positions.

***Develop and Improve Core Competencies at Selected Field Operating Activities (FOA's***

Focus on Key Competencies. Current Corps strategic planning efforts direct the Corps toward defining and maintaining core competencies and capabilities.<sup>23</sup> Core competencies are the foundation skills, specialties or processes that give any business an advantage over its competitors. They form the basis for its end products. For instance, if a barracks design is an end product, the underlying competency is military engineering expertise. Corps leadership should give serious consideration to focusing our key competencies in selected FOA's where they can be developed and improved in a future of smaller workload. ER 1110-1-8158, "Corps wide Centers of Expertise", last updated in January 1998, is a step in this direction. We can fill this gap by:

Audit the location, number and quality of staff associated with key competencies. After determining what competencies are key to the Corps, there should be an initial audit to determine where the persons associated with these competencies are and if they are in the best physical configuration to be maintained in the future. This will be an important consideration if workload continues to decline, especially as the baby boom generation, which owns many of our key technical skills, begins to retire over the next 10-15 years.

Promote cross-District use of core competencies. It has been the case for years that not all Districts can be 'full service' Districts. Yet, the Corps does not do all it could to promote the use of one District's skills by another. It is not unusual to hear a PM state that he/she would rather contract out than use another District. Divisions should seek to actively transfer work across District boundaries when it is important to maintain or develop a core competency. The Corps should pursue establishment of the location(s) where competencies will be maintained and vigorously promote their use.

Develop a sense of the Corps team, and not simply District loyalty, among key technical employees. Corps competencies will be formed around key individuals with exceptional technical expertise. While we have accomplished much in recent years to develop "leaders," we have done little to develop a sense of the whole Corps team among our technical personnel. We should provide many of the same opportunities for leadership, team and perspective development among our key technical employees as we recommend for our future leaders. These would include developmental assignments, serving on 'virtual' project teams with members from other districts, conference attendance, serving on project teams in other districts and other meaningful opportunities.

Support High Grades for Key Technical Personnel. If we define, develop and maintain centers of technical competence that are associated with key individuals of special or exceptional competence, we should celebrate and recognize their importance through high grades based solely on technical ability and not on supervisory function. The R&D community does this now and we should expand the concept to key individuals of high technical competence at recognized centers of competence.

---

<sup>23</sup> "The Core Competence of the Corporation", CK. Prahalad and Gary Hamel, Harvard Business Review, May-June 1990, pp 79-91.

### ***Make Project Management Work***

Despite the Corps realignment of functions towards a project management approach for the past several years, the concept of project management is still not readily accepted, nor uniformly practiced, by all in the Corps family. Thus, project management is not as effective as it should be, and it is not "...the process we use to manage project delivery."

<sup>24</sup> Corps personnel frequently complain that project management is ineffective due to the project manager's lack of understanding of their internal customers needs. To Revolutionize Effectiveness, we can start by improving the understanding and trust of project management at the grass roots levels. Many executors of our projects, i.e. construction and operations personnel, complain that PM's do not understand what it takes to execute a project, and therefore cannot effectively communicate needs to the customers, nor effectively manage a project. There appears to be lack of understanding and trust throughout all our current functional areas: civil works programs, military programs, environmental mission, installation support, and research and development programs. To bridge this gap in making project management work, regardless of the specific program, we recommend:

Rotational TDY details for Project Managers at field offices, installations, or operating projects. PM's need to spend time in the field with their internal customers: resident offices, installations, operating project so that the PM's may directly experience what it takes to execute a construction contract; what it takes to directly interface with and satisfy an installations needs; and what it takes to operate a multi-purpose facility (lock-and-dam, hydropower plant, public use area). These assignments may be short-term, 6-to-9 months in duration. This will educate the PM's in the needs of the project, and greatly increase the trust between the PM and the project's executors.

Form PM-led working groups. Create teams, across functional lines, to resolve issues, whether programmatic, technical, or other in nature. Group members should include all involved personnel, including customers and contractors (an important consideration!). This will not only improve our ideas, facilitate resolution of project problems and needs, and allow the working parties to take ownership, but will also greatly improve trust and communication between both our internal and external customers. Multidisciplinary teams also lead to an aligned vision and direction among the people that make our programs successful. This approach has been implemented with great success by one of our group members in the Chemical Demilitarization program, solving issues in storage and maintenance of a \$110 million Government Furnished Equipment (GFE) program, formulating a baseline network analysis construction schedule for a \$210 million contract, and determining the best ways to package design change orders to implement a \$60 million contract modification with minimal impact to the schedule promised to the customer.

Collocation of related teams. Another example of the PM team approach, as discussed in the HQ Command Inspection Report (dated 06 Nov 97) conducted of Huntsville Center

---

<sup>24</sup> "Strategic Vision", U.S. Army Corps of Engineers, 1997.



(HNC), is internal collocation.<sup>25</sup> In HNC, all contracting teams for A/E Contracting, the Energy Program, Medical, and Chemical Demilitarization program are collocated with the project managers, “to ensure a full-service and continuous integrated team environment.”<sup>26</sup> This, and other similar-theme measures, are needed to assure that project managers have the understanding, education, resources, and team commitment needed to deliver our products.

Realignment at District and Project Office level. The above recommendations could be implemented rather easily in USACE as currently organized. But further measures are needed to move the Corps into a viable organization in the future and address our customer’s top concerns of communication, timeliness, cost, and flexibility. One of the most dramatic and necessary measures needed to both address our customer’s concerns and make project management work is realignment at the grass-root levels. Within the last year, HQ USACE engineering and construction divisions have merged in both the Military Program and Civil Works directorates. A few districts (including Fort Worth, Tulsa, and Albuquerque) also have merged engineering and construction functions. This consolidation facilitates improved communication and teamwork among our technical team members. It should also improve cost and timeliness of execution. Most importantly, it allows the Corps to continuously improve our core competencies of engineering design, construction management, and program execution. Those are the qualities that enable us to be the Nation’s premier engineering organization, and it is vital to maintain and improve those core competencies within the framework of the Chief’s Vision, as we move into the future. To carry this even further, we hope that eventually project management will work so well that the project management stovepipe will disappear, and the project managers will be collocated among their technical team members.

Implement ER 5-1-11. An earlier draft of this paper included several recommendations which have since been incorporated in ER 5-1-11. Now, we simply recommend that the Corps strongly execute the tenets of this regulation. It is important that we continue with our development of strong, PM-led teams as we also continue to give attention to maintaining the technical competence that underpins our work. Most of the complaints registered in the customer surveys concerned our communication and processes, not the quality of our products. The solution to many of these problems is focused, team-driven project management.

Provide human relations and communications training to project managers. The most numerous complaint on both Civil Works and Military Programs customer surveys was the failure to communicate frequently or accurately. This complaint took many forms, but it was clearly the basis for a tremendous amount of customer dissatisfaction. Conversely, delighted customers almost always started by recognizing the quality of the persons with whom they worked. Since the PM is the principal contact with customers, the importance of selecting and training them in communications skills cannot be understated.

---

<sup>25</sup> CERM-M Memorandum for Huntsville Center, subject: HQUSACE Command Inspection of Huntsville Engineer Center, 29 October 1997, 6 November 1997

<sup>26</sup> Ibid.

## **Revolutionize Effectiveness**

### ***Redefine Installation Support***

To continue to meet the needs of the Army installations, we need to broaden the type of support we give these important customers, and move towards “cradle to grave” project support. In a memorandum to LTG Ballard (dated 12 Feb 97), General Reimer stated, “Our installations need help with their infrastructure management. In addition to the problem of excess, we have aging facilities that are not well maintained and are not providing an acceptable level of functional support or quality of life for our soldiers and their families. I would like you to build on the efforts already in place and develop a comprehensive plan to structure us for success and support of Army XXI and beyond. Focus your efforts within USACE to significantly increase the level of support to installations.” However, as noted in the interviews, our Installation customers complain that the Corps cost of doing business is too high and that project delivery is too slow. Therefore, our approach and level of support needs improvement. We propose to close this gap as follows:

Provide “cradle-to-grave” project support to installation DPW’s. Begin by working with DPW staff on DD1391 preparation, estimating and master planning support. Assisting DPW’s at the programming stage should not only produce better installation programming, but should also help Districts better plan their resource requirements, reduce District cost of doing business by having an up-front understanding of project needs, and reduce lost design efforts, including rework.

Use our laboratories’ revitalization capabilities. Provide a complete range of services to enhance the Installation programming efforts

Leverage District and DPW joint resources. This will not only improve the amount and timeliness of District technical support, but will also serve to decrease the total cost of doing business. The Corps has initiated various forms of co-location with DPW’s, ranging from placing a Corps team member, a PM-forward, on the DPW staff (Fort Hood), to collocation of Corps Resident offices with DPW staff (also Fort Hood), to total integration (Rock Island District and Arsenal). These are positive steps towards closing this gap. We can close it further if both agencies, leverage each other’s technical resources. For example, Resident Offices in need of environmental expertise can obtain inspection and review services from the DPW staffs, such as site inspections and design reviews, including such services under an Installation Service and Support Agreement (ISSA). Working technical groups can form to include Resident Office, DPW, and District personnel, as similarly described above.

Leverage Corps and Installation resources to obtain improved Quality Assurance (QA) of construction contracts. We must improve our efforts to assure we deliver the expected quality of the our products, yet must do so within the customer’s needs to reduce our cost of doing business. We may do so by supplementing our QA personnel with the DPW personnel, who currently perform a similar function on DPW projects. In addition to making optimal use of both office’s resources and decreasing costs, sharing staff will further facilitate teaming efforts with our customers, and improve customer satisfaction as we work together to achieve delivery of a quality product.

Develop Core Competencies and Strategic Capabilities. The Corps is moving into an uncertain future where we will be seeking to serve a more diverse customer group than in the past, and those customers' needs will be changing. In this world, it is important that we define our core competencies and capabilities and build our customer and growth strategies around these competencies and capabilities. "Competitive success depends on transforming a company's key processes into strategic capabilities that consistently provide superior value to the customer."<sup>27</sup> The Corps is currently conducting a scenario-based strategic planning effort that should accomplish this end. The Corps should complete this effort and then act to refine and improve the key competencies and capabilities that emerge.

Eliminate services that do not support core competencies or a customer need. For the Corps to become a more responsive, flexible organization in the future, it should concentrate its energies on those end products and services that are served by its core competencies and divest itself of activities that are peripheral to the core business or which do not meet a customer need. As indicated by customer responses to our team members' interviews, we do provide services that our customers are not interested in. In the instances where these services are not central to our business, and where we are able to make the determination, we should eliminate them. An alternative would be to regionalize the support in only one location. Divisions should play a key role in determining the eventual home of this support within their areas of responsibility.

Investigate and develop means to centrally invest in, develop and improve key business processes. When the Corps defines its key competencies and capabilities, it will be important to find a mechanism to develop and maintain them. For instance, if we determine that standardized financial reports at several levels will improve our service to our customers, we must find the means to develop them. It is not in the interest of any single District to develop a report useful to a MACOM or MAJCOM, or to coordinate its development with other than its own customers. However, this could be an important customer service and we should develop the financial capability to centrally support its development. The same is true of other key capabilities. The Corps has recently eliminated its Planning Fellowship Program because of failure of Districts to support it. However, if we do not develop quality planning skills and planners for the future, our Civil Works program will lose direction and develop at the whims of Congress. If quality Civil Works planning is defined to be a key Corps capability, we should find a way to develop and sustain it.

### ***Improve Key Business Processes***

Insure that cost of doing business is competitive and that it can be explained. Complaints about the cost of doing business were the 4<sup>th</sup> most frequent subject on the Military customer survey and the 2<sup>nd</sup> most frequent on the Civil Works survey. For all the frequency of the complaints, and the amount of time the Corps has devoted to this subject, we still do not do a good job of explaining to customers the basis for our costs, or

---

<sup>27</sup> "Competing on Capabilities: The New Rules of Corporate Strategy", G. Stalk, P. Evans, and L.E. Shulman, Harvard Business Review, March-April 1992, pp. 57-68.

how they compare with other, similar organizations. We need to develop a standard means of explaining and reporting costs and to train our PM's to explain these clearly.

Provide timely service. Again, this was a very high frequency complaint of both Military and Civil Works customers. Currently, Corps military time growth targets are 30% for uncontrolled growth and 10% for controlled growth. On its face, it is foolish that an organization that considers itself to be among the preeminent engineering and construction management organizations in the world cannot schedule more accurately and achieve those schedules with more frequency. This appears to be a legitimate customer concern. On the Civil Works side, the complaint was more about the number of years it takes to bring a Civil Works project to fruition. While some projects will not be developed before their time, we should be able to deliver the smaller, non-controversial civil works projects more quickly. Congress is certainly pushing us in this direction. We need to take the initiative and move forward.

Improve post-construction support. Find a way to centrally fund warranty enforcement. This was the 6<sup>th</sup> most frequent negative comment on Military Programs customer survey forms. It is a particular problem for our Army customers. The Corps may deliver its products to installation personnel who are not trained or equipped to manage them, or who are left with lingering problems caused by poor quality construction. We must find a way to return to the project or finance post construction support. When we leave the Installation with a low quality job, we leave a very unhappy customer. We compound the problem if we are unable to help installation personnel correct the deficiencies.

Improve funds management and funds information to the customer. A surprising number of both civil and military customers complained about funds management, including infrequent reports, incorrect information, failure to communicate, funding "surprises" (need for additional funds to pay for changes and claims), and others. MACOM program managers complained about the different information they received from several districts. Funding information is such a simple need to meet that it is surprising that we don't do a better job. One customer commented that, "This District's cost accounting system is super," so we know at least one District does it well. It would be of great benefit to PM's if they had standard reports and processes for getting them to their customers. SWD, for instance, is working to make reports available, real time, to customers on the Internet. This is an example where a HQUSACE-coordinated effort could probably produce a real process benefit and greatly enhance our customer's perception of our business acumen.

Seek means to anticipate and respond more quickly to customer demands and program fluctuations. A repeated customer criticism of the Corps concerned our inflexibility and inability to respond with reasonable speed to customer requirements. This was particularly true for the Civil Works program where customers stated that they were pleased with the service they obtained from Districts, but were not pleased with the length of time required for headquarters review and approvals. The Corps also adjusts slowly to changing MACOM, and other Service, changing needs. This is a multifaceted problem that we should address. Ironically, we probably provide better, more flexible service to our SFO customers than we do to our DoD and, especially our Army, customers—probably because we are not burdened with our own internal hierarchy. We

should continually look for process improvements, not only within our own organization, but also within our customers' organizations, that will enable us to provide more flexible, responsive service.

### ***Improve Customer Support to the Army.***

Standardize business processes that support a single MACOM. In the customer survey responses, MACOM headquarters rated the Corps lower than did their installations. One complaint was the varied processes and reports followed by different Districts who all support a single MACOM. HQUSACE MACOM POC's should investigate those concerns and determine how we might improve our processes to better support the MACOM-level needs.

### ***Improve Civil Works Program Flexibility***

Decrease Washington level review for small projects. This is an old complaint, but it continues to be a problem. In spite of serious efforts by HQUSACE CW staff to streamline CW processes and limit Washington level review to policy issues only, the process continues to be burdensome. It appears unreasonably so for small projects, especially projects clearly supported with Congressional Adds and funding. One \$300,000 project recently required several months to develop and process a 'decision document.' These time consuming processes irritate both local and Congressional sponsors who see their funds being used for bureaucratic procedures rather than dirt and concrete. There were several comments to this effect on the Civil Works survey forms. The ASA(CW) and the Corps should consider more delegation and more flexible processes for smaller projects.

Give District commanders more authority to commit resources. District commanders are limited in their authority to commit to accepting work for others and to sign project cooperation agreements (PCA) with customers. This is another area where commanders should be granted more authority to commit to work within specified parameters, especially for small projects.

Establish different processes for small and large projects. Many of the customer comments about timeliness and cost were about small projects where the costs are more visible and sensitive. Local sponsors of small projects, and DPW's with limited budgets, are often more sensitive to the costs of small projects than large ones. Corps headquarters, divisions and districts should all seek innovative processes for processing small projects and contracts efficiently. Much good work has been done in this area in recent years as the Corps has sought to improve its support to Installations. We should simply continue to seek improvement in this area.

Reorient HQUSACE and divisions to competency and capability maintenance. It is precisely because core competencies and capabilities cross functions and FOA's that the champion of a competencies-based strategy must be the head of the organization. Also, because the competencies are cross functional, the strategy surrounding them and their continued development and maintenance must be centrally directed. For instance, if the HQUSACE program manager determines that the Corps can only afford to maintain

HTRW contracting, design and construction management expertise in 3 locations, he/she must then determine the locations and establish the business, training, marketing and other processes necessary to develop and maintain that core competency. While the Corps has taken some steps in this direction with specific programs, it needs to add to the mission statement of HQUSACE the requirement to develop and maintain key core competencies and capabilities as soon as they are defined by the senior leadership.

Share successful processes, reports and procedures across districts. In some ways the Corps has gotten better at sharing successful processes across Districts. In other ways it seems to have become worse. The advent of the local and wide-area networks have done much to promote real-time information sharing in recent years. On the other hand, downsized programs have limited funds for training and conferences, so people seem to meet with their counterparts less than ever. The Corps would be wise to focus on sharing “best practices” processes, procedures and technologies in selected areas such as funds management and installation support activities. We should use new techniques (video, shared data bases, the Internet and others) in test locations to determine what the best practices are, make them available to others, and then provide incentives for incorporating them into other Districts and projects. This would not only enhance our processes and our value to our customer, it would serve to create the “Corps team” atmosphere that will be important to our future success as an organization.

### **Grow the Program**

Restructure the organization to sustain core competencies. Two related recommendations have been provided above so we will not belabor this point except to state that the Corps must organize to develop and maintain its core competencies, once defined. This is a responsibility of both HQUSACE and Divisions. The recently directed Regional Management Boards (RMB's) should serve to recommend to the Division Commander the regionalization of some areas of competence that it cannot afford in all Districts and which will deteriorate if scattered among all Districts. These are difficult decisions to make and to implement, but they are critical to the future of the Corps. One place to start is with the Civil Works planning function. This is a function which is absolutely critical to the future of the Civil Works program, but there are many districts that do not have sufficient planning program to maintain in-depth capability. If the function is to be sustained, it will have to be concentrated into some subset of the 38 Corps Civil Works Districts.

Seek to grow work that sustains and grows core competencies and products. As it moves into the future, the Corps should not seek any and all design and construction work “to keep busy.” Rather, it should determine those core competencies essential to success in its traditional Civil Works Program and to the Army in peacetime and in wartime. The Corps should then focus its program growth in areas and agencies that will help maintain its competencies. This is not a new idea, but needs to be reinforced around the key competencies when they are developed.

### ***Redefine Installation Support***

Create joint Corps-DPW organizations and support DPW O&M mission. The test partnership between Rock Island District and Rock Island Arsenal is a huge step forward in this arena as are the concepts developed by the USACE Reinvention Center for Installation Support. If it is successful, it should be adopted at other installations. Also note in this partnership effort that the responsible project office is under the District's Operations Division, which reaches across traditional stovepipes to streamline the total Army resources necessary to accomplish the mission. In another instance, Dyess AFB was provided the means to contract for grounds maintenance and mowing, when their capability to perform that function was no longer available.

Rethink our traditional support. As our installations are downsized and their funding decreased, they look toward the Corps for increased, affordable, support, particularly for operations and maintenance functions. We should consider, for instance, a Resident Office of construction managers and quality assurance personnel, with the balance of support located at the host district. Another way to provide the complete service that installations are seeking, but in a simple, cost effective manner, is to locate full-service cells in our field offices. These cells would have design capability for small projects, by having a CADD in place with a server link to the host district. Staffing, though small, would consist of designers, contracting, construction managers/administrators, real estate, and other personnel as warranted by the workload.

DPW's should be encouraged to consider non-traditional area of Corps support. We must improve our communications with the installations to assure they are aware of our innovative and non-traditional support services such as Region-wide Job Order Contract Administration; Indefinite Quantity Contracts (IDIQ with Time & Materials, Roofing/Painting/Paving, Asbestos/Lead-Paint Removal); Condition Assessment Surveys/Project Development; Environmental/Natural Resource Management Functions; Maintenance Contract Administration; Total AR 210-20 Support (Programming/1391's and PDBs; Planning Activities and Studies; Mapping and Surveying; Maintain Installation Data Bases at District). The installation benefits from District support programs through access to the District's resources, which can be used to enhance mission support capabilities, supplement technical capabilities and expand the manpower capacity of the installation when needed. The District's resources simply become an extension of the Installation Commander's staff.

Focus districts on marketing, execution and customer support. In an earlier recommendation, we stated that HQUSACE and Division offices should be focused on the development and maintenance of key competencies. Similarly, Districts should be focused on marketing, program execution and customer support. The latter two are traditional, however, marketing is new territory for many Districts. Districts should develop marketing skills in their key personnel and should take an active role in developing their future SFO programs, as well as their traditional Civil Works and Military Programs.

## ***VII. SUMMARY***

The Corps of Engineers has enjoyed a history of productive and successful service to the Army and the Nation. The future history of the Corps is entrusted to the current leadership. Today's challenges are no greater or less than at any other time in our history. As past leaders have met their challenges, so ours must meet theirs. The principal challenge of today is to transition the Corps into a smaller, more flexible, more cost effective organization, able to adjust more quickly than ever to changing technology, changing conditions and programs and changing customers. To do that, we need to define those key competencies and capabilities that are important to our future and then to build our program around them.

In short, the Corps of Engineers must "Revolutionize for Effectiveness", "Seek Growth Opportunities", and "Invest in People" throughout our programs, and must do so in a manner that satisfies our customer's concerns of communication, timeliness, cost, and flexibility. In their survey responses our customers describe gaps in our current processes and contributions that must be closed. We should learn from them. Accordingly, we have developed 38 recommendations to close these gaps. As we all become agents of change and seek out innovations such as co-location of our internal team members and more extensive services to our installations, we must also maintain and improve our core competencies of engineering design, construction management, and program execution. We are all confident that every member of the Corps is proud to be part of the Corps team, and will continue their efforts to improve our effectiveness and enhance our team's services to the Nation. All we need is consistent direction into the future.